

1. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow 9^-} \frac{7}{(x-9)^7} + 3$$

- A.  $\infty$
  - B.  $-\infty$
  - C.  $f(9)$
  - D. The limit does not exist
  - E. None of the above
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2. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 9} \frac{\sqrt{4x-20} - 4}{5x-45}$$

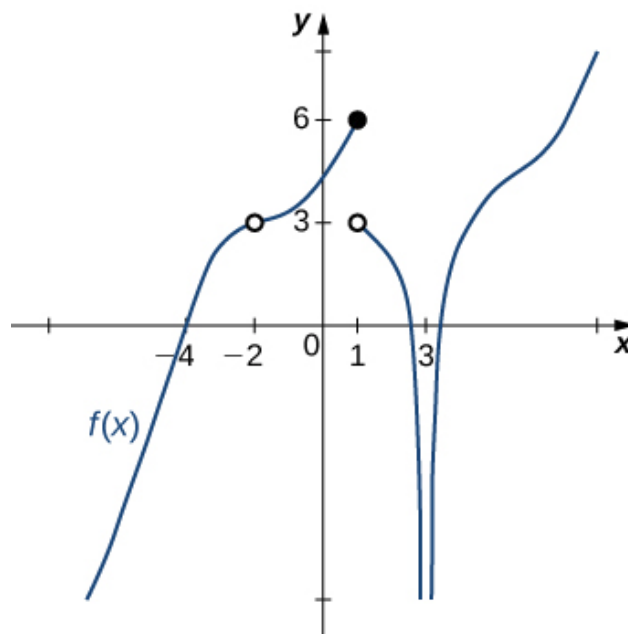
- A.  $\infty$
  - B. 0.125
  - C. 0.025
  - D. 0.100
  - E. None of the above
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3. Based on the information below, which of the following statements is always true?

*As  $x$  approaches 7,  $f(x)$  approaches 8.652.*

- A.  $f(7)$  is close to or exactly 8
- B.  $f(8)$  is close to or exactly 7
- C.  $f(7) = 8$
- D.  $f(8) = 7$
- E. None of the above are always true.

4. For the graph below, evaluate the limit:  $\lim_{x \rightarrow -4} f(x)$ .



- A.  $-6$
- B.  $-\infty$
- C.  $0$
- D. The limit does not exist
- E. None of the above

5. Evaluate the one-sided limit of the function  $f(x)$  below, if possible.

$$\lim_{x \rightarrow -6^-} \frac{4}{(x+6)^4} + 2$$

- A.  $f(-6)$
- B.  $-\infty$
- C.  $\infty$
- D. The limit does not exist
- E. None of the above

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6. To estimate the one-sided limit of the function below as  $x$  approaches 5 from the right, which of the following sets of numbers should you use?

$$\frac{\frac{5}{x} - 1}{x - 5}$$

- A.  $\{4.9000, 4.9900, 4.9990, 4.9999\}$
  - B.  $\{4.9000, 4.9900, 5.0100, 5.1000\}$
  - C.  $\{5.1000, 5.0100, 5.0010, 5.0001\}$
  - D.  $\{5.0000, 5.1000, 5.0100, 5.0010\}$
  - E.  $\{5.0000, 4.9000, 4.9900, 4.9990\}$
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7. Evaluate the limit below, if possible.

$$\lim_{x \rightarrow 4} \frac{\sqrt{9x - 11} - 5}{8x - 32}$$

- A. 0.100
  - B. 0.375
  - C. 0.013
  - D.  $\infty$
  - E. None of the above
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8. Based on the information below, which of the following statements is always true?

*As  $x$  approaches 7,  $f(x)$  approaches  $\infty$ .*

- A.  $f(x)$  is close to or exactly  $\infty$  when  $x$  is large enough.
- B.  $f(x)$  is undefined when  $x$  is close to or exactly 7.
- C.  $x$  is undefined when  $f(x)$  is close to or exactly  $\infty$ .
- D.  $f(x)$  is close to or exactly 7 when  $x$  is large enough.

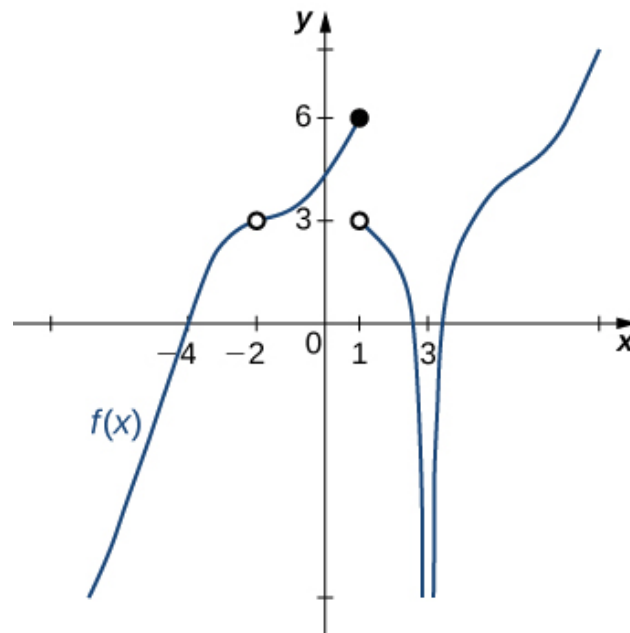
E. None of the above are always true.

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9. To estimate the one-sided limit of the function below as  $x$  approaches 9 from the right, which of the following sets of numbers should you use?

$$\frac{\frac{9}{x} - 1}{x - 9}$$

- A.  $\{8.9000, 8.9900, 9.0100, 9.1000\}$   
B.  $\{8.9000, 8.9900, 8.9990, 8.9999\}$   
C.  $\{9.0000, 8.9000, 8.9900, 8.9990\}$   
D.  $\{9.0000, 9.1000, 9.0100, 9.0010\}$   
E.  $\{9.1000, 9.0100, 9.0010, 9.0001\}$

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10. For the graph below, find the value(s)  $a$  that makes the statement true:  
 $\lim_{x \rightarrow a} f(x) = 3$ .



- A.  $-2$   
B.  $-\infty$

C. 1

D. Multiple  $a$  make the statement true.

E. No  $a$  make the statement true.

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